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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/541,444	03/31/2000	Erik C Cota-Robles	042390.P7920	3693

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EXAMINER

OPIE, GEORGE L

ART UNIT	PAPER NUMBER
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2126

DATE MAILED: 06/15/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/541,444

Examiner

George L. Opie

Applicant(s)

Cota-Robles

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- 1) ☒ Responsive to communication(s) filed on 28 January 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) ☐ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ☐ is/are allowed.
- 6) ☒ Claim(s) 1-8 and 10-29 is/are rejected.
- 7) ☒ Claim(s) 9 and 30 is/are objected to.
- 8) ☐ Claim(s) ☐ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ☐ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on ☐ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some * c) ☐ None of the CERTIFIED copies of the priority documents have been:
1. ☐ received.
2. ☐ received in Application No. (Series Code / Serial Number) ☐.
3. ☐ received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. & 119(e).

Attachment(s)

- 14) ☐ Notice of References Cited (PTO-892)
- 15) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 16) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 20.
- 17) ☐ Interview Summary (PTO-413) Paper No(s). ☐.
- 18) ☐ Notice of Informal Patent Application (PTO-152)
- 19) ☐ Other: ☐

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DETAILED ACTION

This Office Action is responsive to Amendment A, in which claims 1-19, 21-24 and 26-30 were amended.

1. Request for copy of Applicant's response on floppy disk:

Please help expedite the prosecution of this application by including, along with your amendment response in paper form, an electronic file copy in WordPerfect, Microsoft Word, or in ASCII text format on a 3½ inch IBM format floppy disk.

Please include all pending claims along with your responsive remarks. Only the paper copy will be entered -- your floppy disk file will be considered a duplicate copy. Signatures are not required on the disk copy. The floppy disk copy is not mandatory; however, it will help expedite the processing of your application. Your cooperation is appreciated.

2. Allowable Subject Matter

3. Claims 9 and 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

4. Claim Rejections - 35 U.S.C. § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

5. Claims 1-3, 5-6, 10-13 and 27 are rejected under 35 U.S.C. § 102(e) as being anticipated by Gulick (U.S. Patent 6,421,702).

As to claim 1, Gulick teaches a method for scheduling a plurality of virtual machines (scheduling of a plurality of isochronous tasks, p7 48 – p8 5) comprising:
determining a respective resource requirement (X) for each virtual machine (VM)

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(determining the maximum percentage of the operating system bandwidth allocated to isochronous tasks, p12 5-18)
determining a respective interrupt period (Y) for each VM (interrupt is variable based on the interval of the currently executing isochronous tasks, p5 44-51)
and
scheduling said plurality of VMs based, at least in part, on said respective X and Y values (scheduler 218 dynamically sets the timer ... and passes control to the first task, p6 12-35).

As to claims 2-3, Gulic (p3 40-51) teaches "[e]ach isochronous task informs the operating system of an execution interval and a duration."

As to claims 5-6, note the rejections of claims 2-3 above.

As to claims 10-13, note the discussions of claims 1, 6, 3 and 2 respectively. Claims 10-13 are the same as claims 1, 6, 3 and 2, except claims 10-13 are computer program product claims and claims 1, 6, 3 and 2 are method claims.

As to claim 27, note the rejection of claim 1 above. Claim 27 is the same as claim 1, except claim 27 is an apparatus claim and claim 1 is a method claim.

6. Claim Rejections - 35 U.S.C. § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 4, 7-8, 14-16 and 28-29 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Gulick in view of Maytal (U.S. Patent 6,092,095).

As to claim 4, Maytal teaches the service manager 50 for maintaining resource requirements (p2 40-45 and pages 6-8). It would have been obvious to combine Maytal's teachings with Gulick because the service manager would facilitate administration efficacy by adjusting resource allocations to each VM as its requirements warrant for acceptable operations and optimal system usage/performance.

As to claim 7, note the rejection of claim 4 above.

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As to claim 8, Maytal (p8 27-56) teaches performance monitoring for scheduling and adjusting resource requirements as recited. It would have been obvious to combine Maytal's teachings with Gulick because the monitoring of a VM's actual usage would enable the system to perform resource allocation tuning for continually maximizing the system's capabilities.

As to claims 14-16, note the discussions of claims 4 and 8 above. Claims 14-16 are the same as claims 4 and 8, except claims 14-16 are computer program product claims and claims 4 and 8 are method claims.

As to claims 28-29, note the discussions of claims 4 and 8 supra. Claims 28-29 are the same as claims 4 and 8, except claims 28-29 are apparatus claims and claims 4 and 8 are method claims.

8. Claims 17-26 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Webber (U.S. Patent 6,412,035).

As to claim 17, Webber (p5 10-24) teaches the determining interrupt values by initializing the interrupts and generating virtual interrupts, and filtering (Fig. 2, page 5) and adjusting the interrupt period values (page 6 47-52). Although Webber does not explicitly disclose the rejecting aperiodic interrupts, it would have been an obvious modification for one skilled in the art to have included this rejection in the filtering taught by Webber.

As to claims 18-19, Webber (p4 14-40) teaches the scheduling VMs with respect to resource requirement values as claimed.

As to claims 20-21, Webber (p2 38 – p3 9) teaches scheduling VMs contingent on interrupt frequency and resource requirements, and for one skilled in the art, the recited resource requirement adjustments would have naturally flowed from Webber's interrupt management teachings for handling real-time operations in general purpose operating systems.

9. The prior art of record and not relied upon is considered pertinent to the applicant's disclosure. Each reference disclosed below is relevant to one or more of the Applicant's claimed invention.

U.S. Patent No. 6,374,286 to Gee et al. which teaches the resource management and scheduling of multiple virtual machines;

U.S. Patent No. 6,075,938 to Bugnion et al. which teaches the virtual machine monitors for coordinating/adjusting VM operations.

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10. Response to Applicant's Arguments:

Applicant argues (claims 1, 10 and 27) that Gulick's teachings do not meet the scheduling virtual machine limitations. Contrary to Applicant's contention, the Gulick reference discloses the operating system scheduling interrupt periods for different types of real-time and general purpose processing (p7 48 – p8 5) and these allocated periods clearly meet the claimed scheduling of virtual machines. Gulick's scheduler 218, p6 12- schedules a plurality of modules that execute the different types of given tasks. Scheduler 218 functions with the OS to manage the modules that in turn run the respective programs. Furthermore, the scheduling adjusts to provide the modules with different amounts of resources according to the requested tasks that each module will execute. Hence, Gulick's scheduling system with sections for the various task-types does read-on the scheduling a plurality of virtual machines as broadly claimed.

The scope of the claimed "scheduling ... virtual machines" clearly transcends the more narrow scope that Applicant attempts to impute through argument. Claimed subject matter, not the specification is the measure of the invention. Limitations in the specification cannot be read into the claims for the purpose of avoiding the prior art, *In re Self*, 213 USPQ 1,5 (CCPA 1982); *In re Priest*, 199 USPQ 11, 15 (CCPA 1978). The "scheduling ... virtual machines" and the concomitant claim elements are clearly subject to a broad interpretation, as detailed in the rejections maintained above. The Examiner has a *duty* and *responsibility* to the public and to Applicant to interpret the claims *as broadly as reasonably possible* during prosecution (see *In re Prater*, 56 CCPA 1381, 415F.2d 1393, 162 USPQ 541 (1969)).

In considering the virtual machine scheduling recitations, it is noted that Applicant uses terminology that has broad meaning in the art, and thus requires a broad interpretation of the claims in determining patentability of the disclosed invention. Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Applicant should set forth claims in language that clearly, distinctly, unambiguously and uniquely define the invention. The fact that Applicant has not narrowed the definition/scope of the current claims implies that Applicant intends an extensive coverage breadth of the claims, which is clearly met by Gulick's scheduling teachings. Consequently, the scheduling virtual machines, in the manner recited in the pending claims does not constitute a patentable distinction over the prior art.

Applicant's arguments have been fully considered but are deemed to be unpersuasive. For the reasons detailed above, the rejections are maintained as set forth supra.

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11. THIS ACTION IS MADE FINAL.

A SHORTENED STATUTORY PERIOD FOR RESPONSE TO THIS FINAL ACTION IS SET TO EXPIRE THREE MONTHS FROM THE DATE OF THIS ACTION. IN THE EVENT A FIRST RESPONSE IS FILED WITHIN TWO MONTHS OF THE MAILING DATE OF THIS FINAL ACTION AND THE ADVISORY ACTION IS NOT MAILED UNTIL AFTER THE END OF THE THREE-MONTH SHORTENED STATUTORY PERIOD, THEN THE SHORTENED STATUTORY PERIOD WILL EXPIRE ON THE DATE THE ADVISORY ACTION IS MAILED, AND ANY EXTENSION FEE PURSUANT TO 37 C.F.R. § 1.136(a) WILL BE CALCULATED FROM THE MAILING DATE OF THE ADVISORY ACTION. IN NO EVENT WILL THE STATUTORY PERIOD FOR RESPONSE EXPIRE LATER THAN SIX MONTHS FROM THE DATE OF THIS FINAL ACTION.

12. Contact Information:

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system.

Status information for published applications may be obtained from either Private-PAIR or Public-PAIR.

Status information for unpublished applications is available through Private-PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>.

Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

- ☐ All responses sent by U.S. Mail should be mailed to:

**Commissioner for Patents
PO Box 1450
Alexandria, VA 22313-1450**

- ☐ Hand-delivered responses should be brought to Crystal Park Two, 2021 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist). All hand-delivered responses will be handled and entered by the docketing personnel. Please do not hand deliver responses directly to the Examiner.

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The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

All OFFICIAL faxes will be handled and entered by the docketing personnel. The date of entry will correspond to the actual FAX reception date unless that date is a Saturday, Sunday, or a Federal Holiday within the District of Columbia, in which case the official date of receipt will be the next business day. The application file will be promptly forwarded to the Examiner unless the application file must be sent to another area of the Office, e.g., Finance Division for fee charging, etc.

- ☐ Any inquiry of a general nature or relating to the status of this application should be directed to the Group receptionist at **(703) 305-9600**.
- ☐ Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Opie at (703) 308-9120 or via e-mail at *George.Opie@uspto.gov*. Internet e-mail should not be used where sensitive data will be exchanged or where there exists a possibility that sensitive data could be identified unless there is an express waiver of the confidentiality requirements under 35 U.S.C. 122 by the Applicant. Sensitive data includes confidential information related to patent applications.

